

# CBAA 2017 RADIO STATION TECHNOLOGY BOOTCAMP

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with  
Michelle Brown

**TECHNOGRAMA**

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## Who are we?

### • Maiz

- **The tech**
- Presenter
- Closet manager
- Member of Technorama
- CBF grant assessor
- Committed gap-bridger

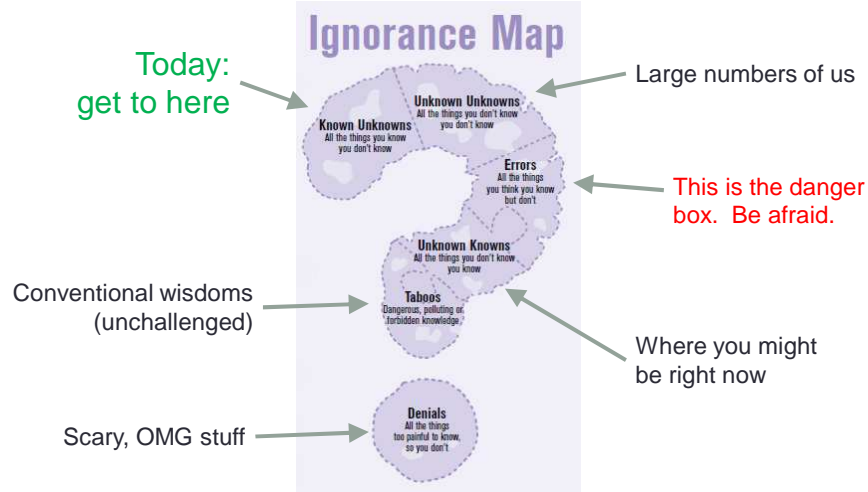


### • Michelle

- **The manager**
- Presenter
- Closet tech
- Member of Technorama
- CBF grant assessor
- Committed gap-bridger



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## Basis for this session

### • Typical Challenge

- Station management has business responsibility
- Broadcasting is a technology business

### • But..

- Through lack of training, business responsibility is not always supported by specific technical knowledge
- Result: decisions being made by people who **don't know what they don't know**

## A bumpy ride

- This session will be a bit of a firehose
- Take you to point where you know
  - Some questions to ask
  - Who to ask
  - Where to find people to ask the questions
- So you **will KNOW what you DON'T KNOW**

## What we'll cover in this session

- Some technical language
- End-to-end signal path
- Common grant application mistakes
- Alignment of priorities
  - Tech vs Management
  - Regulatory vs operational



## Communicating with your tech people

- Who doesn't have a tech?
- Your techs will be guided by the Four Drivers
  - Make things
  - Fix things
  - Manage risk
  - Uphold the truth
- And your techs need hugs
- Check CBAA 2016 technologist panel:
  - [www.technorama.org.au](http://www.technorama.org.au) – look for **Resources** tab



## What **should** be important to you?

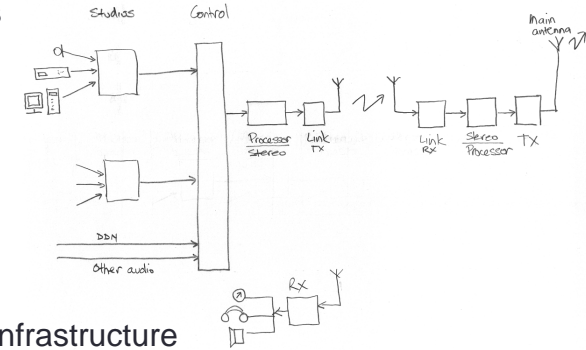
- How does it sound?
  - Your listeners = your customers
- How does it work?
  - Your volunteers = your human capital
    - If things don't work, your volunteers are negatively impacted
- Are you adequately resourced?
  - Your tech volunteers = your architects & builders

## Managing tech change: considerations

- Who knows what?
- Can you validate what you're being told?
  - Do you know enough to keep the troops honest?
- What's your disaster plan?
- You most likely don't know what you don't know

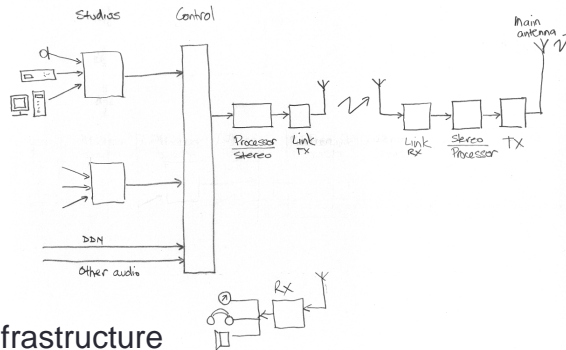
## The basic architecture of a station

- Program sources
- Studio
- Control
- Transmitter link
- Transmitter
- Antenna
- Monitoring
- Computers & IT infrastructure



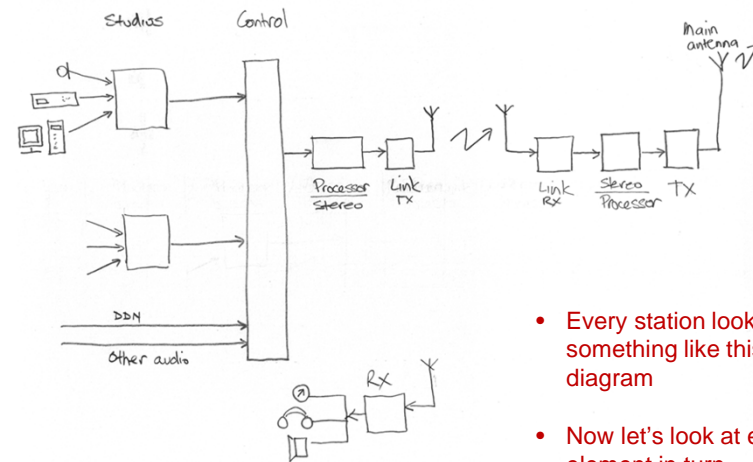
## Grant applications: big cost centres?

- Program sources
- Studio
- Control
- Transmitter link
- Transmitter
- Antenna
- Monitoring
- Computers & IT infrastructure



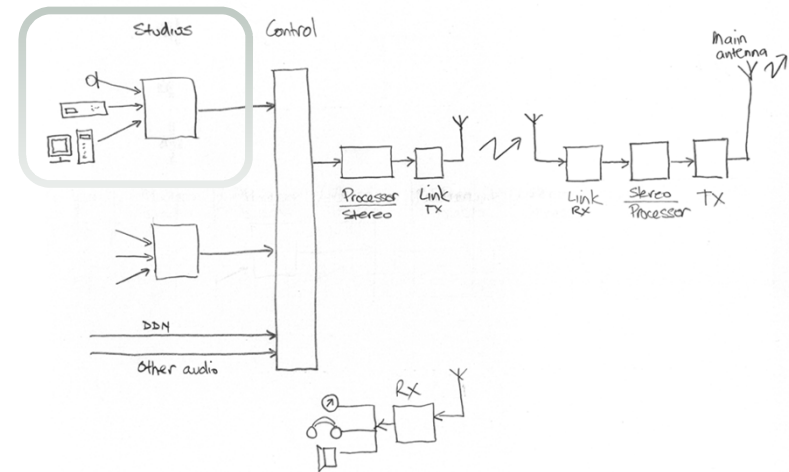
Yep... it's the same stuff!

- Every station looks something like this block diagram
- Now let's look at each element in turn



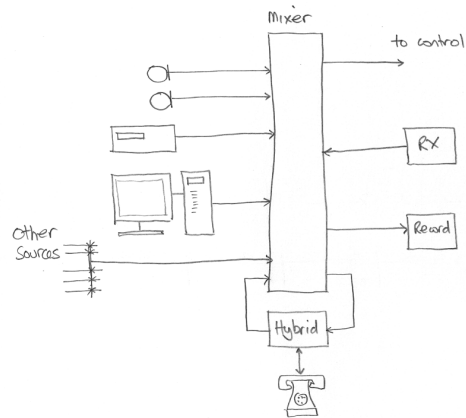
## Important – do not pass GO yet

- You will (or should) be thinking about your station
- Where are you heading?
- Plan for the future – not the past
- Does your strat plan say what you want to achieve?
- **THAT** should drive future tech requirements



## Studio

- Sources
  - Mics
  - Turntables?
  - CD
  - Phones
    - For talking
    - On-air
      - Hybrid
      - Phone channel
  - Sticks
  - Pods
  - BYOD
- Headphones
- Speakers

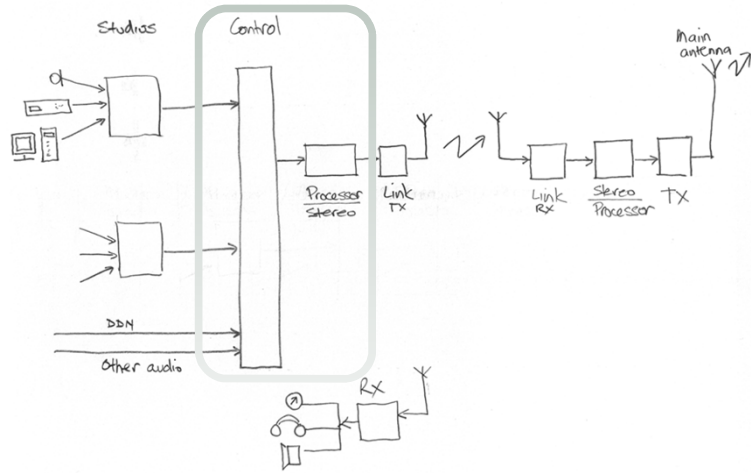


## Studio design: CEBWEEI\*?

- Often starts with equipment
- Actually **SHOULD** start with human factors
- Mixer
- Sources/Studio gear
- Automation

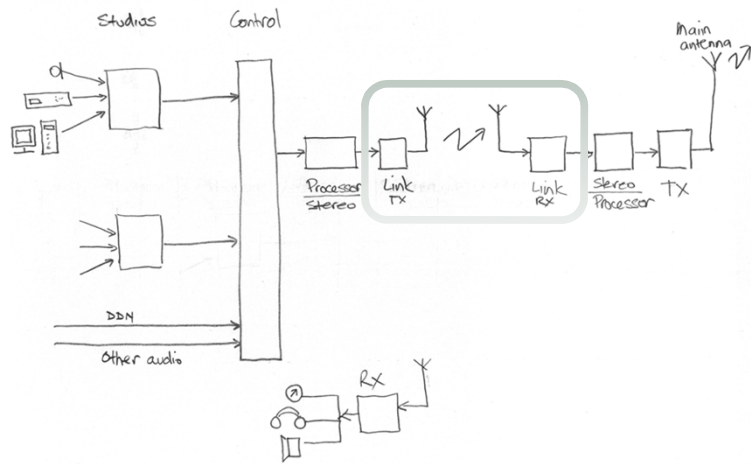
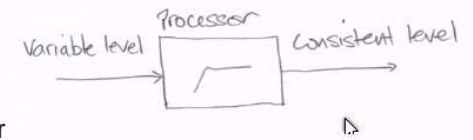
\*Can everything be where everything else is?





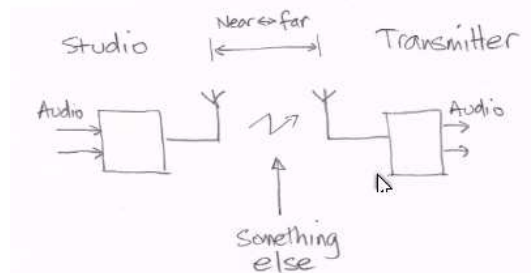
## Control: "the transmission room"

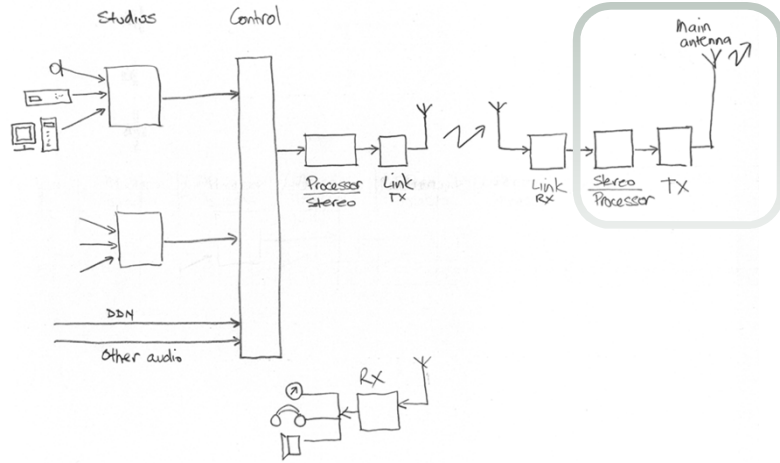
- Studio switching
- Audio processing
  - Compressor
  - Limiter
  - Must protect your transmitter
- Off-air monitoring
- Emergency/backup power
  - Especially Emergency services status
- Air conditioning



## Studio-transmitter-link

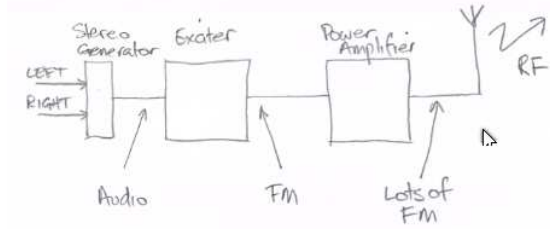
- Many possible technologies
  - FM link
  - Digital link
- OB link: same?
- Analogue vs digits?





## Transmitter site

- Main stuff
  - Stereo Generator
  - Exciter
  - Power amplifier
  - Antenna
  - Dummy load
- Air conditioning
- Emergency/backup power
  - Especially if Emergency Services status



## Basic antenna

Vertical dipole



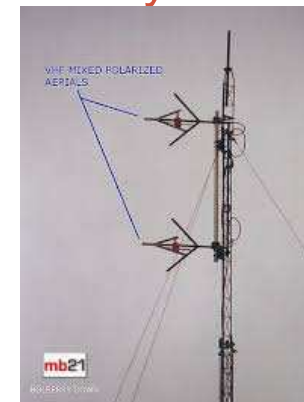
Folded dipole



Mixed polarisation

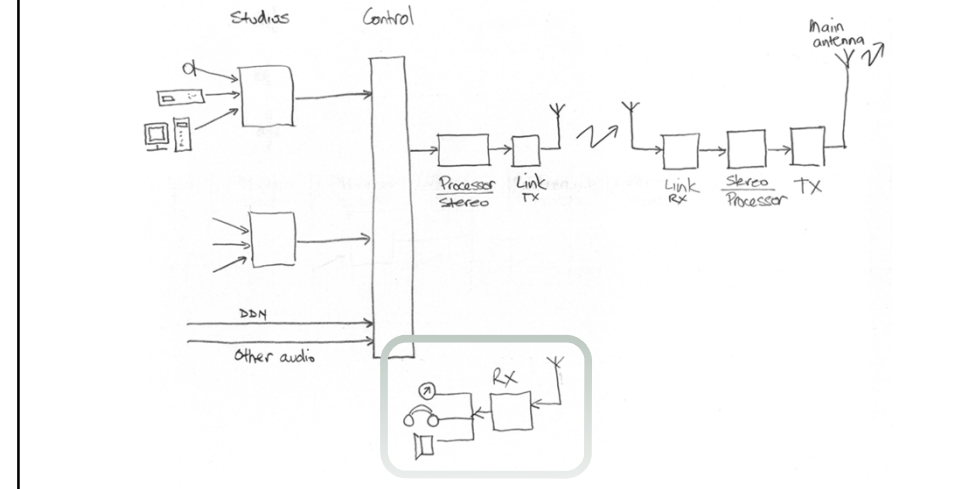
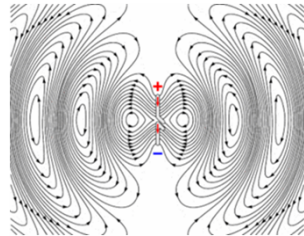


## Actual antenna: stacked arrays



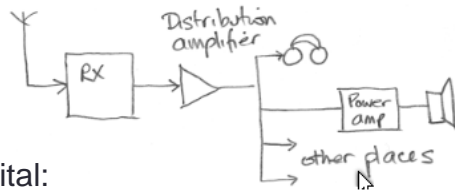
## Transmitter site: antenna

- Antenna height – signal heads to the horizon at FM freq.
- **Theoretical power output**
  - Determined by/set in your LAP
- Antenna gain set by design – number of elements
- **Actual power output**
  - $(\text{TX power} * \text{antenna gain}) - \text{losses}$
- Antenna (so signal) polarisation
  - Vertical (OK, grandfathered)
  - **Mixed** (much better than vertical)



## Monitoring

- Off-air receiver
  - Have the best you can
  - Monitor your TX!
- If your studio or link is digital:
  - Monitoring is more complex
  - Latency adds audio delay
  - Your presenters cannot listen to themselves with more than 5-10ms of delay



## Grant application: “It’s worn out....”

### What deteriorates

- Headphone pads
- Microphone pop shields
- Pickup stylii
- CD lasers
- Faders and switches
- Speaker surrounds (maybe)
- Antennae
- Power supplies
  - capacitors dry out, especially if hot
- Transmitters (FETs and caps)

### What doesn't deteriorate

- Microphones (50yrs+)
- Mixers
  - But faders and switches need care and attention
- Signal processors
- A good diagram
- On air lights
- Non-mechanical things....

## What is your absolute goal?

- Align Board and Management priorities with volunteer and tech priorities
- Have your station documented at a block diagram level
- Know that the station is set up and lined up correctly
- Establish what skills are available to your station
  - Your own people can be augmented by the tech community!!
- Support and engage with Technorama and CMTO training
- Get someone in with calibrated gear
  - Critical, but infrequently needed once it's done properly

## www.technorama.org.au

- Support development of the sector's big asset
  - Technologists
- Costs just \$10/year to be a member
  - Join via the website
  - Heaps of benefits...
- **Get your station on the mailing list**
  - Sign up via the website – costs nothing, and you stay informed
- Join Technorama Q&A (Facebook closed group)
  - HUGE resource!

## Tips: things to think about after this...

- **It's OK to not know. It's NOT OK to pretend that you DO know.**
- Diagrams improve your chances with CBF grant applications
- Ensure your tech is a member of Technorama.
  - costs almost nothing.
- Ensure your station admin, Manager and Chair are on the Technorama mailing list
  - costs nothing. Stay in touch with Tech developments.
- Tell us what we can do to help: email [info@technorama.org.au](mailto:info@technorama.org.au)
- If you don't know how to explain a tech problem:
  - take photos, provide evidence, draw diagrams... don't just guess what the problem is.
- Put tech training on your stratplan.
  - Support the CMTO and Technorama training agenda
- Put technology strategy on your stratplan, and keep the tech strategy plan current
- THINK BIG. Reach for the sky rather than the floor.
- Send your Tech to TR18 (will be announced via the mailing list)

## Big finish

**TECHNORAMA**

- Tech is like driving
  - not everyone is a racer, but you can do your bit
- Join Technorama
  - Get on the Technorama Q&A group and ask away...
- Invest in your technologists
  - Grow a team
  - Budget to send someone to Technorama each year